

## CLAIM AMENDMENTS

Pursuant to 37 CFR 1.121, a complete listing of all claims in the application, and their status, is set forth below. The text of each pending claim is also provided. Please amend the pending claims as follows, wherein added matter is underlined and deleted matter is ~~strikethrough~~ or [[double bracketed]] in the text of the currently amended claims, relative to the immediate prior version. The claims in this listing are deemed to replace all prior claims in the application.

1-115 (Cancelled)

116. (Cancelled)

117. (Cancelled)

118. (Currently Amended) An implantable cardioverter defibrillator system for determining and delivering an optimal programmed first-shock strength based on the upper limit of vulnerability, comprising:

- (a) a plurality of implantable electrodes;
- (b) a shock delivery subsystem, connected to the electrodes; and
- (c) a ULV subsystem comprising;
  - i) a sensor, connected to the electrodes, for sensing the electrical activity of the heart, including a change with respect to time of the T-wave of a cardiac signal and including the presence of fibrillation;

- ii) a timer connected to the sensor for providing a series of shock times, timed relative to the a maximum derivative of the T-wave;
- iii) a test-shock driver, connected to the timer, for transmitting timing and amplitude information regarding T-wave test shocks;
- iv) a memory unit, connected to the test shock driver and the shock subsystem, for storing programmable values such as comprising pacing cycle length, timing intervals, an initial shock strength, and values for incrementing and decrementing shock strength; and
- v) a controller, connected to the sensor, test-shock driver, and shock subsystem for determining the maximum derivative of the T-wave, and for incrementally varying shock strength and the shock times; whereby wherein the system provides a test shock having a shock strength and shock time selected by the controller;

(d) wherebywherein the controller is programmed to cause:

- (i) the shock subsystem delivers an initial test shock to the heart at an initial shock strength and an initial shock time; and if the heart does not fibrillate
- (ii) the system delivers a sequence of test shocks to the heart at the same shock strength and different shock times; and if the heart does not fibrillate
- (iii) the system decreases the shock strength[[],] by a strength decrement and delivers test shocks at a sequence of intervals; and if the heart does not fibrillate
- (iv) the system repeats steps (d) (i) – (iii) until the heart fibrillates, whereby the shock strength of the test shock immediately prior to the test shock that induces fibrillation represents the upper limit of vulnerability, and whereby the optimal programmed first shock strength of an implantable cardioverter defibrillator system is predicted by a fixed increment in relation to the energy level determined to be the upper limit of vulnerability.

119. (Original) The system of claim 118, wherein the system operates when the heart is in its native rhythm.

120. (Original) The system of claim 118, wherein the system operates when the heart is paced, the system further comprising a pacer for overdrive pacing the heart, the timer being electrically connected to the pacer and shock times further being timed in relation to one or more pacing spikes from the pacer according to a time delay.

121. (Currently Amended) The system of claim 118, wherein the programmed shock strength of ~~an~~ the implantable cardioverter defibrillator is a value incrementally higher than the upper limit of vulnerability.

122. (Original) The system of claim 118, wherein the strength decrement is at least 2 Joules.

123. (Currently Amended) The system of claim 118, wherein the timer provides at least four time delays comprising time delays measured from a base time, measured from a predetermined point on ~~an~~ electrogram the electrical activity of the heart to the maximum of the first derivative of the T-wave with respect to time, plus an offset interval  $\Delta T$ .

124. (Original) The system of claim 123, wherein the offset intervals are: 0 milliseconds before the maximum derivative of the T-wave, 20 milliseconds before the maximum derivative of the T-wave, 40

milliseconds before the maximum derivative of the T-wave, and 20 milliseconds after the maximum derivative of the T-wave .

125. (Original) The system of claim 123, wherein the offset intervals are: 0 milliseconds before the maximum derivative of the T-wave, 20 milliseconds before the maximum derivative of the T-wave, 20 milliseconds after the maximum derivative of the T-wave, and 40 milliseconds after the maximum derivative of the T-wave .

126. (Currently Amended) The system of claim 118, wherein the electrode arrangement ~~consists~~ comprising of implanted implantable electrodes.

127. (Currently Amended) The system of claim 126, wherein the implanted implantable electrodes includes at least one intracardiac electrode.

128. (Currently Amended) The system of claim 126, wherein the implanted implantable electrodes includes at least one intravascular electrode.

129. (Currently Amended) The system of claim 126, wherein the implanted implantable electrodes includes at least one subcutaneous electrode.

130. (Currently Amended) The system of claim 126, wherein the implanted implantable electrodes includes at least one submuscular electrode.

131. (Currently Amended) The system of claim 126, wherein the implanted implantable electrodes includes at least one epicardial electrode.

132. (Original) The system of claim 126, wherein the electrodes include at least one cutaneous electrode.

133. (Currently Amended) The system of claim 118, wherein the controller is programmed to cause: a sequence of one or more test shocks are delivered at only one shock strength, and if fibrillation is not detected, the programmed shock strength is set to a value that is a fixed increment greater than the test shock strength.

134. (Currently Amended) The system of claim 133, in which the energy level shock strength is 15 Joules.

135. (Original) The system of claim 133, wherein the fixed increment is 5 J above the energy level.

136. (Cancelled)